



100 GROVE ST. | WORCESTER, MA 01605

September 30, 2019

Joseph Laydon
Town Planner
Grafton Municipal Center
30 Providence Road
Grafton, MA 01519

Grafton Conservation Commission
Grafton Municipal Center
30 Providence Road
Grafton, MA 01519
T 508-856-0321
F 508-856-0357
gravesengineering.com

RECEIVED

Subject: **Grafton Water District, 98 Worcester Street Pump Station
Site Plan and Stormwater Management Review**

SEP 30 2019

Dear Joe:

**PLANNING BOARD
GRAFTON, MA**

We received the following documents in our office on August 27, 2019:

- Document entitled Site Plan Approval Application dated August 2019, prepared by Tighe & Bond for Grafton Water District.
- Document entitled Stormwater Management Report dated August 2019, prepared by Tighe & Bond for Grafton Water District.
- Plans entitled Grafton Water District, Worcester Street Pump Station Replacement Project, Permit Drawings dated August 2019, prepared by Tighe & Bond for Grafton Water District. (14 sheets)

Graves Engineering, Inc. (GEI) has been requested to review and comment on the plans' conformance with applicable "Grafton Zoning By-Law" amended through October 15, 2018; Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and standard engineering practices on behalf of the Planning Board. GEI has also been requested to review and comment on the documents' conformance with applicable Conservation Commission "Regulations Governing Stormwater Management" dated May 2013 on behalf of the Conservation Commission. GEI was authorized to proceed with this review on September 18, 2019. As part of this review review, GEI performed a reconnaissance site visit on September 18, 2019.

Our comments follow:

Zoning By-Law

1. The plans must identify the ownership of all abutting land. (§1.3.3.3.d.11)
2. The plans must include all property lines of the subject property as well as all setbacks and easements (if any). Whereas the project is proposed on a small portion of a large parcel, a separate plan sheet or an inset at a different scale than the construction plans that identifies the project parcel and abutters would be reasonable. (§1.3.3.3.d.13)

Grafton Regulations Governing Stormwater Management

3. The limit of work was used as the subcatchment boundary for stormwater modeling. Up-gradient areas draining to a proposed facility need to be included in the model. (§6.B.3.g)

x:\shared\projects\graffonpb\graffonwaterdistrictworcst98\reviews\j093019.doc

4. The hydrologic calculations for existing conditions modeled the grass cover and woods in "fair" hydrologic condition. All pervious lands must be assumed to be in "good" hydrologic condition regardless of conditions existing at the time of computation. (§6.B.3.j)

Hydrology & MassDEP Stormwater Management

5. GEI reviewed the hydrology computations and found them to be in order except as noted in Comment #3 and #4.
6. Compliance with the MassDEP Stormwater Handbook is reasonable except as noted in the two following comments.
7. The bioretention basin is used to infiltrate the required recharge volume and to attenuate peak flows. Soil test pit data (or other groundwater level data) must be provided to demonstrate the basin satisfies the required two-foot separation to seasonal high groundwater.
8. When discharging to an infiltration structure (i.e. the bioretention basin) within a Zone II, at least 44% of the total suspended solids (TSS) must be removed prior to discharge to the infiltration-portion of the structure. The design engineer may wish to consider adding another best management practice (BMP) in series with the pea stone diaphragm (e.g. a sediment forebay such as a stone berm at the inlet-side of the bioretention basin). The Stormwater Report references a vegetated filter strip, but the slope between the pea stone diaphragm and the bioretention basin is too steep to be considered a filter strip.
9. The recharge volume and water quality volume provided by the bioretention basin is noted as 3,796 cubic feet in Appendix D of the Stormwater Management Report but the hydrology calculations (also in Appendix D) modeled a volume of 3,277 cubic feet. Nevertheless, enough recharge volume and water quality volume are available in the bioretention basin.

General Engineering

10. The design intent for the bioretention basin is reasonable, but the proposed topographic contours on Sheet C-104 (the Proposed Grading Plan) show what appears to be a built-up berm around the bioretention basin (the proposed 311 contour closes on itself). Based upon the existing 311 and 312 topographic contours, the existing elevation at the bioretention basin is higher than 311 feet but lower than 312 feet. The proposed 311 contour needs to be revised.
11. Stabilized construction entrance details were provided on Sheets C-201 and C-203, however, the location of the construction entrance also needs to be provided in plan-view, perhaps on Sheet C-102.
12. The size of the precast concrete dry well needs to be specified on the plans. The dry well construction detail on Sheet C-203 lists multiple dry well sizes.
13. Although not the subject of this review, on Sheet C-105 a gate valve is shown on the water main where a hydrant tee should be. The gate valve should be located either before or after the tee.

14. Although not the subject of this review, Sheet C-103 specifies three 10" steel bollards whereas the construction detail on Sheet C-201 specifies 6" steel bollards. The information should be consistent.

We trust this letter addresses your review requirements. Feel free to contact this office if you have any questions or comments.

Very truly yours,
Graves Engineering, Inc.



Jeffrey M. Walsh, P.E.
Principal

cc: Danielle Teixeira, P.E.; Tighe & Bond
Matt Pearson, Grafton Water District